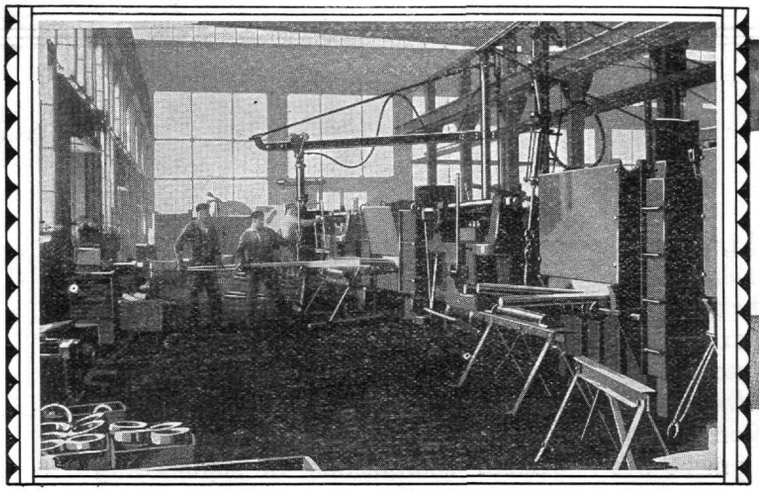
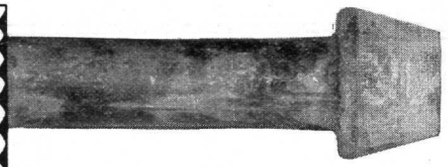
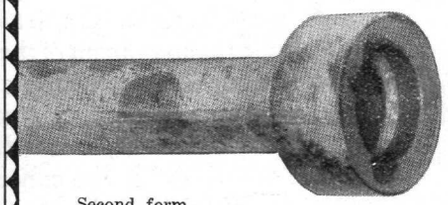
. . . an empire hung on that strap . . . .



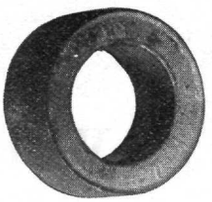


First form



Second form

A corner of New Departure's mammoth Forge Plant — one of the largest in the world — where a unique upset forging process gives peculiar endurance to the finished ball bearing.



Completed forging

Forging the Sinews of Endurance

UPSET forging plays an interesting and important part in making the New Departure Ball Bearing so enduring that it will outlive the machine in which it is installed—*and yet never wear within itself to the extent of requiring adjustment.*

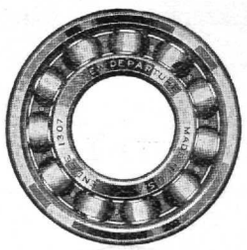
This method increases the density of the steel by compression and likewise controls the flow of the steel fibre—a feature with a direct bearing on endurance life, as will be explained.

The bar is first heated to an exact temperature checked constantly by optical pyrometers to obtain a non-oxidizing atmosphere for the prevention of scaling.

The first blow of the forming die in making the inner race ring produces the shape shown in the first form. This is immediately followed by the second operation, by which the ring is formed. The third or piercing operation cuts the ring from the bar.

Thus the fibre or grain of the steel flows into carefully predetermined channels, bringing it *parallel* to the surface at the points of greatest load in the finished and revolving bearing.

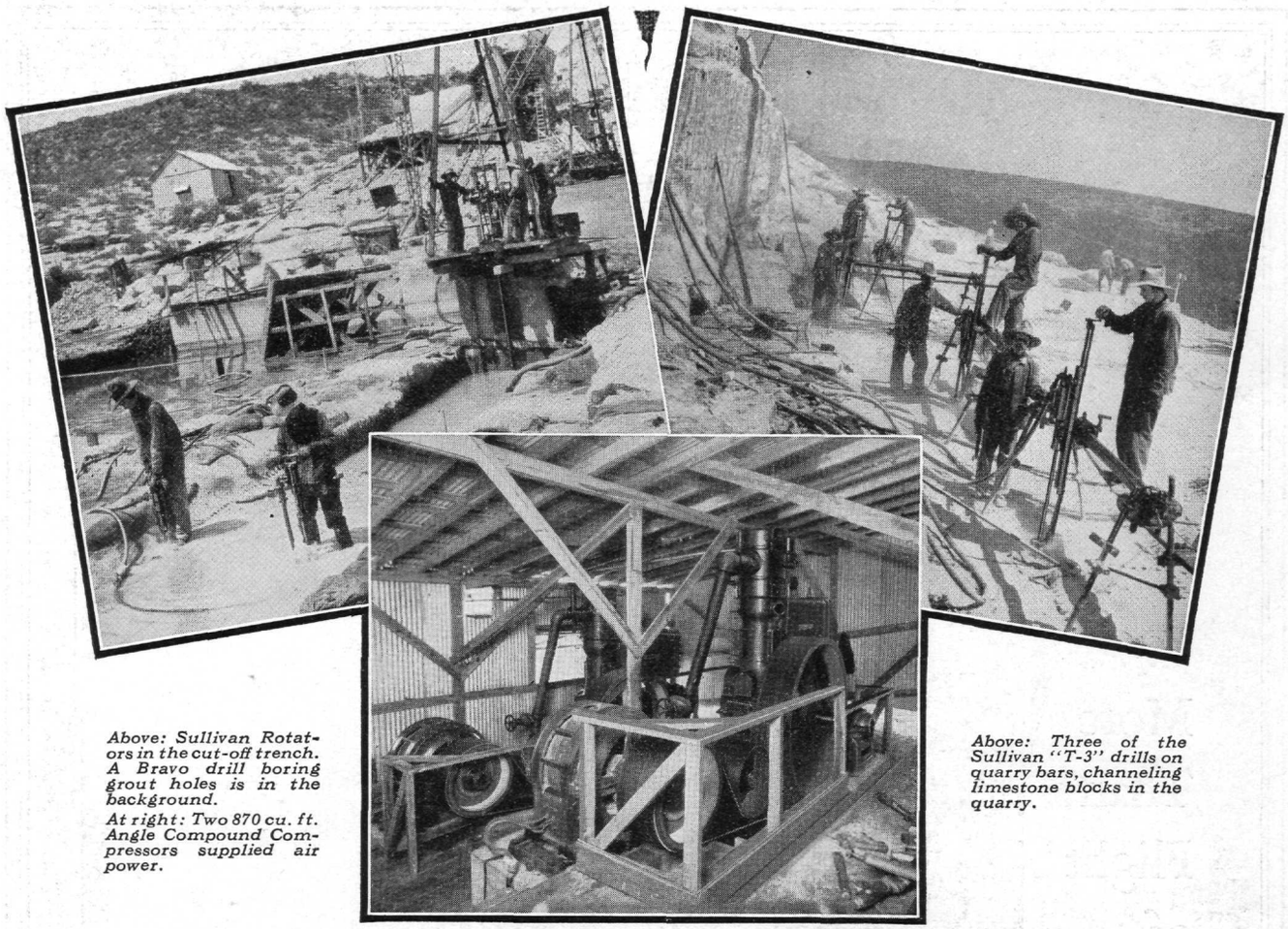
Normalizing and annealing operations which follow relieve all internal strains and greatly refine the grain size of the steel. The direction of the fibre for maximum endurance remains unchanged.



New Departure Ball Bearings

The New Departure Manufacturing Co.,
Bristol, Connecticut
Chicago · Detroit · San Francisco

1106



Above: Sullivan Rotators in the cut-off trench. A Bravo drill boring grout holes is in the background.

At right: Two 870 cu. ft. Angle Compound Compressors supplied air power.

Above: Three of the Sullivan "T-3" drills on quarry bars, channeling limestone blocks in the quarry.

Modern Engineering Gives Electricity
to the plains of West Texas

WITH the discovery of oil, West Texas needed electric power. And now, in the heart of the mesquite plains around Del Rio—the first hydro-electric dam has been completed. It is 900 feet long, and 45 feet wide, and will harness the waters of Devil's River.

In building the dam, modern engineering overcame one after another of nature's obstacles.

Sullivan Diamond Drills took 2-in. cores 50 feet deep in the bedrock to determine its safety for the dam; and to reveal seams, which later were filled with cement to prevent seepage, underneath.

No sand for concrete was available—so limestone blocks were chiselled from the river bank, to form the dam. Line drilling with Sullivan Rock Drills and quarry bars, removed the blocks from the quarry. Eight of these rigs drilled 28 miles of hole in one month.

When the limestone blocks were in position, the Diamond Drills bored holes through which cement grout was pumped, to fill up cavities and crevices.

Sullivan Equipment and Sullivan Engineering have helped in the realization of many of America's largest pioneering enterprises, both public and commercial.

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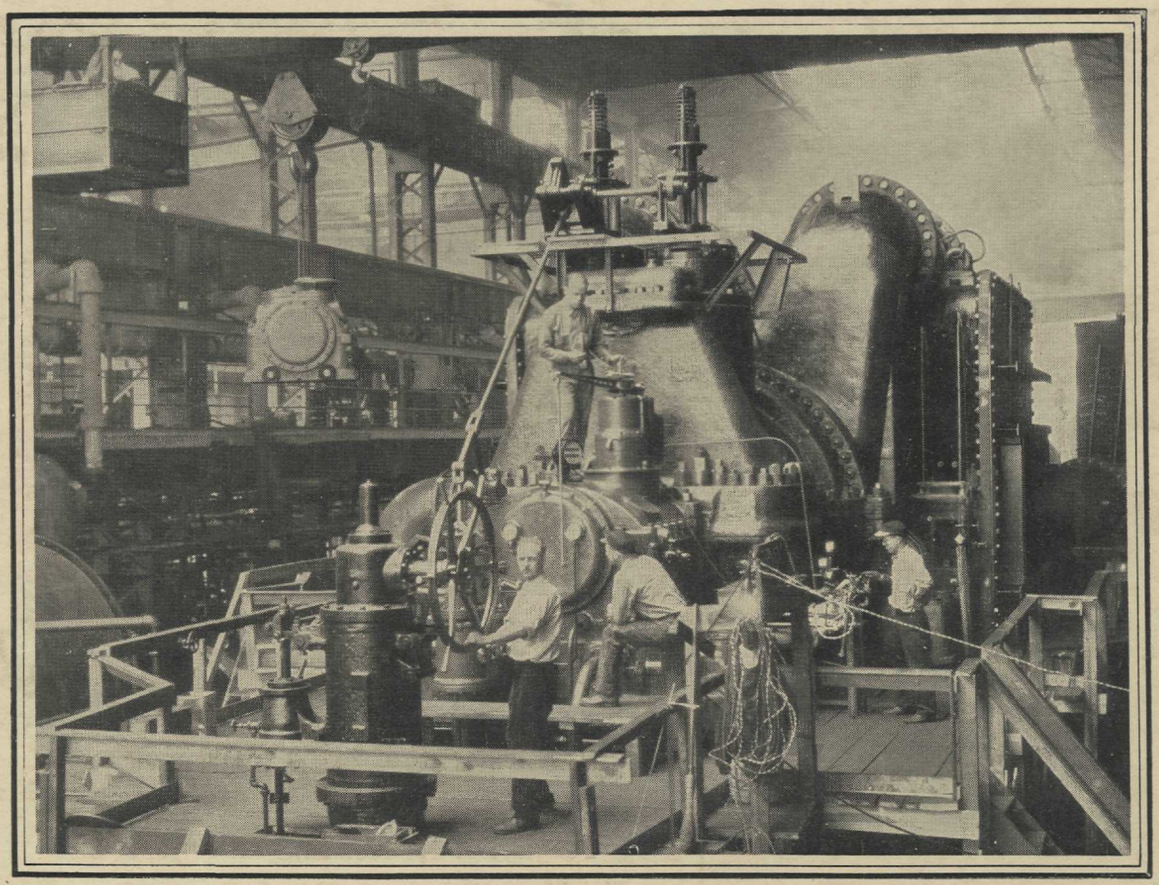

"Kick it Over"

"How's the oil, Ed?"
"O. K."
"All right, Bill, kick it over."

A valve is opened; a rush of steam strikes a myriad of buckets, and one of the largest turbines ever built—a thousand tons of delicate machinery valued at nearly two million dollars—makes its initial run in the Schenectady shops of the General Electric Company.

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